CLAIMS

WHAT IS CLAIMED IS:

1. An electrodeionization device comprising: a shell surrounding an inner module, said shell including a first end, a second end opposite the first end, and an inner wall; an electrode enclosed within the inner wall of said shell; and an electrical contact plate attached along the inner wall of said shell, said electrical contact plate conductively connected to said electrode within said shell to transfer current to said electrode.

2. The device of Claim 1, further comprising a first vessel cover connected to said shell at the first end, and an electrical contact member attached to said first vessel cover, said electrical contact member arranged to conductively connect to said electrical contact plate to transfer current to said electrical contact plate.

3. The device of Claim 2, wherein said electrical contact member is a reed electrically coupled to a DC source outside of said device such that DC is transferred to said electrode.

4. The device of Claim 2, wherein said electrical contact plate is arranged to be a conductive bridge between said electrical contact member and said electrode.

5. The device of Claim 2, said shell further including a first shoulder extending inwardly from the inner wall, said first shoulder abutting said electrode adjacent the first end, said first shoulder arranged to restrict said electrode from sliding beyond said first shoulder toward said first vessel cover, and to restrict said first vessel cover from sliding beyond said first shoulder toward said electrode.

6. The device of Claim 2, further comprising a second vessel cover connected to said shell at the second end, wherein said first vessel cover, said second vessel cover and said shell form a housing for the electrodeionization device.

7. The device of Claim 6, said shell further including a second shoulder extending inwardly from the inner wall, said second shoulder abutting said electrode adjacent the second end, said second shoulder arranged to restrict said electrode from sliding beyond said second shoulder toward said second vessel cover, and to restrict said second vessel cover from sliding beyond said second shoulder toward said electrode.

8. The device of Claim 1, said shell further including a first shoulder extending inwardly from the inner wall, said first shoulder abutting said electrode adjacent the first end and arranged to restrict said electrode from sliding beyond said first shoulder.

9. The device of Claim 8, said shell further including a second shoulder extending inwardly from the inner wall, said second shoulder abutting said electrode adjacent the second end and arranged to restrict said electrode from sliding beyond said second shoulder.

10. The device of Claim 1, wherein the electrodeionization device is spiral wound to form a helical electrodeionization device.

11. The device of Claim 10, wherein said electrode is a cylindrical metal member extending within the inner wall.

12. The device of Claim 1, wherein said electrode is an anode.

13. The device of Claim 1, wherein said electrode is formed of stainless steel or titanium alloy.

14. The device of Claim 1, wherein said shell is plastic and said electrode is integrated within said plastic shell.

15. The device of Claim 1, wherein said electrode is coated with platinum layer or silver-ruthenium alloy.

16. An electrodeionization device comprising: an anion exchange membrane; a cation exchange membrane; a first electrode; at least one membrane bag formed by the anion

exchange membrane and the cation exchange membrane; a second electrode; said at least one membrane bag having a concentrate flow channel; a dilute flow channel located adjacent said at least one membrane bag, said at least one membrane bag and said dilute flow channel forming an inner module; a shell surrounding said inner module, said shell including a first end, a second end opposite the first end, and an inner wall, said second electrode enclosed within the inner wall of said shell; and an electrical contact plate attached along the inner wall of said shell, said electrical contact plate conductively connected to said second electrode within said shell to transfer current to said second electrode.

17. The device of Claim 16, further comprising a first vessel cover connected to said shell at the first end, and an electrical contact member attached to said first vessel cover, said electrical contact member arranged to conductively connect to said electrical contact plate to transfer current to said electrical contact plate; and a second vessel cover connected to said shell at the second end, wherein said first vessel cover, said second vessel cover and said shell form a housing for the electrodeionization device.

18. The device of Claim 17, said shell further including a first shoulder extending inwardly from the inner wall, said first shoulder abutting said second electrode adjacent the first end, said first shoulder arranged to restrict said second electrode from sliding beyond said first shoulder toward said first vessel cover, and to restrict said first vessel cover from sliding beyond said first shoulder toward said second electrode; and said shell further including a second shoulder extending inwardly from the inner wall, said second shoulder abutting said second electrode adjacent the second end, said second shoulder arranged to restrict said second electrode from sliding beyond said second shoulder toward said second vessel cover, and to restrict said second vessel cover from sliding beyond said second shoulder toward said second electrode.

19. The device of Claim 16, wherein the electrodeionization device is spiral wound to form a helical electrodeionization device.

20. The device of Claim 19, wherein said at least one membrane bag and said dilute flow channel are wound about said axially extending conduit, and said dilute flow channel is positioned between wound layers of said at least one wound membrane bag.